

Claims:

1. A workstation for performing steps of a resin application process for dynamo-electrical machine components, said workstation comprising a plurality of units,

5        wherein at least one of said units is of a first type comprising:

             a cabinet for providing a controlled ambient during the performance of a step of said process; and

10                a rotating vertical support structure disposed in said cabinet, said support structure having a plurality of fixtures disposed in an annular region thereon for holding said components during the performance of said step.

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             2. The workstation of claim 1 wherein a said fixture comprises a structure for receiving said components therein along a path substantially perpendicular to the face of said rotating vertical support structure.

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             3. The workstation according to claim 1 wherein said cabinet further comprises an annular compartment having said controlled ambient, and wherein

25        said held components travel through said annular compartment as said vertical support structure rotates during the performance of said process step.

             4. The workstation according to claim 1

30        wherein said the temperature of said controlled ambient is controlled by flow of heated air through said cabinet.

5. The workstation according to claim 4  
wherein said fixtures comprise open structures that allow  
35 air to circulate therethrough and expose substantial  
surface portions of said held components to said  
controlled ambient.

6. The workstation of claim 1 further  
40 comprising a control unit to control rotation of said  
vertical support structure.

7. The workstation of claim 6 wherein the  
rotation of said vertical support structure is  
45 intermittent with alternating periods of rotation and  
periods of pause, and wherein at least one of said  
fixtures is aligned with a predetermined position during  
said periods of pause.

8. The workstation of claim 7 wherein the  
50 angle of rotation during a said period of rotation is  
less than about one half a radian.

9. The workstation of claim 7 wherein said  
55 predetermined position corresponds to a position for  
loading and unloading components from said aligned  
fixture.

10. The workstation of claim 1 wherein said  
60 plurality of units are disposed adjacent each other, said  
workstation further comprising movable transfer devices  
disposed alongside said plurality of units for loading  
and unloading components from said units, and for  
transferring components between said plurality of units,

65 wherein said movable transfer devices are capable of  
motion in linear spatial dimensions.

11. The workstation according to claim 1  
wherein a first one of said plurality of units preheats  
70 said components in preparation of subsequent resin  
application.

12. The workstation according to claim 11  
wherein a second one of said plurality of units applies  
75 resin to said components.

13. The workstation according to claim 12  
wherein said second one of said plurality of units is a  
unit of said first type.

80 14. The workstation of claim 13 wherein a  
multiplicity of said fixtures in said second one of said  
plurality of units are aligned with a multiplicity of  
resin-receiving positions as said vertical support  
85 structure rotates, and wherein at said resin-receiving  
positions resin is applied to components loaded in said  
aligned fixtures.

15. The workstation of claim 14 wherein said  
90 second one of said plurality of units further comprises  
resin-dispensing units that are disposed vertically above  
said resin-receiving positions.

16. The workstation of claim 13 wherein said  
95 second one of said plurality of units further comprises  
vertically movable resin-bearing trays that are disposed  
vertically below said resin-receiving positions.

100           17. The workstation according to claim 1  
wherein a third one of said plurality of units heats said  
components to cure the resin applied to said components.

105           18. The workstation according to claim 1  
wherein said plurality of units comprise:

          a preheating unit of said first type for  
heating components in preparation for subsequent resin  
application;

110           a resin application unit of said first type  
disposed adjacent to said preheating unit for applying  
resin to preheated components;

          a resin-curing unit of said first type disposed  
adjacent to said resin application unit for heat curing  
the resin applied to components;

115           movable transfer devices disposed alongside  
said plurality of units for loading and unloading  
components from said plurality of units and for  
transferring components between said plurality of units;  
and

120           a control unit to control rotation of said  
vertical support structures in said preheating, resin  
application, and resin curing units, and to control said  
movable transfer devices.

125           19. The workstation of claim 18 wherein said  
control unit synchronizes the intermittent rotation of  
said vertical support structures such that the periods of  
pause in said preheating unit, in said resin application  
unit, and in said resin curing unit occur substantially

130 simultaneously such that said vertical support structures  
are stationary at substantially a same time interval.

20. The workstation of claim 19 wherein said  
control unit supervises said transfer devices to load and  
135 unload components from said plurality of units during  
said same time interval while said vertical support  
structures are stationary.

21. A unit for performing a resin application  
140 process step for dynamo-electric machine components, said  
unit comprising:

a cabinet for providing a controlled  
temperature ambient during the performance of said  
process step;

145 a rotating vertical support structure  
disposed in said cabinet, said support structure having  
an array of fixtures disposed in an annular region  
thereon for holding said components,

wherein said held components travel  
150 through said controlled ambient as said vertical support  
structure rotates during the performance of said process  
step.

22. The unit of claim 21 wherein a said  
155 fixture comprises a structure for receiving said  
components therein along a path substantially  
perpendicular to the face of said rotating vertical  
support structure.

23. The unit of claim 21 wherein said  
160 controlled temperature ambient is controlled by flowing  
heated air through said cabinet.

24. The unit of claim 23 wherein said fixtures  
165 comprise open structures that allow air to circulate  
therethrough and expose substantial surface portions of  
said held components to said controlled ambient.

25. The unit of claim 21 wherein said cabinet  
170 further comprises an annular compartment having said  
controlled ambient, and wherein said wherein said held  
components travel through said annular compartment as  
said vertical support structure rotates during the  
performance of said process step.

26. The unit of claim 21 wherein said cabinet  
further comprises a compartment for cooling said  
components after the performance of said process step.

27. A method for applying resin to dynamo-  
180 electrical machine components, comprising:

loading said components in first holding  
fixtures, wherein said first holding fixtures are  
disposed in an annular region on the face of a first  
185 vertical support plate rotatably mounted in a preheating  
cabinet;

flowing heated air through said cabinet to  
provide a temperature controlled ambient therein;

rotating said first vertical support plate such  
190 that said loaded components travel through said  
controlled temperature controlled ambient and are heated  
to a predetermined temperature;

unloading said heated components from said  
preheating cabinet;

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transferring said unloaded heated components to a resin application unit, wherein said resin application unit comprises means for applying a quantity of resin to said components; and

200 in said resin application unit.

28. The method of claim 27 wherein said rotating said first vertical support plate further comprises rotating said first vertical plate intermittently with first periods of rotation alternating with first periods of pause such that a said first holding fixture disposed on said first vertical support plate is aligned with a first loading position, wherein said unloading said heated components from said preheating cabinet further comprises unloading a said heated component from said first holding fixture aligned with said first loading position during a said first period of pause, and

210 wherein loading said components in first holding fixtures further comprises loading a said component in said first holding fixture aligned with said first loading position from which said heated component has been unloaded during same said first period of pause.

29. The method of claim 28 wherein transferring said unloaded heated components to a resin application unit further comprises:  
reloading said unloaded heated components in an empty second holding fixture, wherein a plurality of said second holding fixtures are disposed in an annular region on the face of a second vertical support plate rotatably mounted in said resin application unit, and wherein said

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reloading occurs while said second vertical support plate is stationary and said empty second holding fixture is aligned with a second loading position; and wherein applying resin to said transferred components in said resin application unit further comprises:

intermittently rotating said second vertical support plate with second periods of rotation alternating with second periods of pause to advance said reloaded heated component away from said second loading position through said resin application unit; and

using said means for applying a quantity of resin during a second period of pause after said advanced component has moved away from said second loading position to apply resin said advanced component.

30. The method of claim 27 further comprising: heat curing the resin applied to said components.

31. The method of claim 30 wherein heat curing the resin applied to said components further comprises:

transferring said components with resin applied to them out of said resin application unit;

loading said components in third holding fixtures, wherein said third holding fixtures are disposed in an annular region on the face of a third vertical support plate rotatably mounted in a resin-curing cabinet;

flowing heated air through said resin-curing cabinet to provide a temperature controlled ambient therein; and

rotating said third vertical support plate such that said loaded components travel through said controlled ambient to heat said applied resin.